

Appn. No. 10/051,417  
Response dated August 25, 2003  
Reply to Office Action of May 28, 2003

### REMARKS/ARGUMENTS

#### Rejections Under 35 USC§103

Claims 1-3, 11, 18-21, 26-32 are rejected under 35 USC§103(a) as being obvious over Mochizuki et al, U.S. Patent 4,985,523 (hereinafter Mochizuki). Claims 4-7, 12-14 and 22-23 are rejected under 35 USC§103(a) as being unpatentable over Mochizuki in view of Santella, U.S. Patent 5,375,569 (hereinafter Santella). Applicants traverse these rejections for the reasons stated hereinafter and respectfully withdrawal of the rejections.

#### Arguments

For clarity purposes, arguments against all of the rejections will be presented together. The essence of the invention is the presence or use of a structural adhesive to bond and hold a valve cover to a cylinder head. This feature is included in Claims 1, 11 and 18, with the phrase "wherein the adhesive has sufficient adhesive strength to hold the valve cover in place". Another novel is the requirement that the valve cover does not have bolt holes which have a primary function of holding of the valve cover to the cylinder head, found in Claims 2 and 32. Another novel feature is the requirement that the adhesive demonstrates a cohesive strength of 250 psi or greater when measured in lap shear modes according to ASTM D-3165-91 found in Claims 26, 28 and 30. Another novel feature is the requirement of the presence of integral fastening means present to hold the valve cover in place until the adhesive cures found in Claims 22 and 23. The references cited do not teach or suggest these novel features. In view of the fact that the cited references do not teach or suggest the recited features, Applicants' claims are unobvious and the claims should be allowed.

In order for case of *prima facie* obviousness to properly presented, an Official Action must provide an explanation of the elements of the claim which are specifically taught in the primary reference and motivation from secondary references to modify the primary reference to achieve the undisclosed elements. If an Office Action does not provide motivation to make the modifications of the primary reference to get to all of the elements of the claimed invention, the Applicants have a right to a patent. The preamble of 35 USC reads: "A person shall be entitled to a

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patent unless . . .". The remainder of 102 lists those criteria upon which the claims of the patent may be rejected. The import of the section is that unless the Official Action clearly details how a reference meeting one of the criteria of describes each element of the claimed invention and a secondary reference meeting one of the criteria of 35 USC §102 provides motivation for modifying the features of the primary reference to achieve all of the elements of the claimed invention, Applicants have a right to a patent. In view of the fact that the Examiner has not made out a case of *prima facie* obviousness, Applicants are entitled to allowance of the claims in this application. More particularly, the official action does not provide motivation to modify the teachings of the Mochizuki to include the elements described above as missing from the reference to get to all of the elements of the claimed invention.

Mochizuki discloses anaerobically curing adhesive compositions, see col. 1, lines 64 to col. 2, line 49. The adhesive is designed to seal joints in automobile engines including sealing head covers to engine heads, see col. 1, lines 16-20. The reference does not disclose the features recited hereinbefore. The issue is where is the motivation to modify Mochizuki to get Applicants' claimed invention, that is to include the missing elements as described above. In order for such motivation to be present, there must be secondary evidence that clearly suggests to the skilled artisan the necessary modifications to add these omitted elements. Applicants assert that the Office Action does not provide sufficient motivation to modify the teachings of Mochizuki to add the missing elements to the primary reference to get to Applicants' claimed invention. Applicant challenges the Examiner to specifically point out where in the cited references there is a suggestion to add each of the missing elements to the elements disclosed in Mochizuki. Absent a clear articulation of the passages in the references which provide this motivation the claims must be allowed according to the passage from 102 discussed above.

The cited references in the Official Action disclose the use of an adhesive to seal joints. See Mochizuki, col. 1, lines 16-20; col. 7, lines 9-49; col. 12, lines 64-65 and col. 13, lines 19-22. Mochizuki does not provide any disclosure of how to hold a valve cover in place on an engine head. Santella discloses valve covers affixed and held to engine heads by the use of bolts and bolt holes. See Figures 1 and

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2, in particular, reference no. 18. Note, that Figure 2(a) is a cut-away of the same valve cover as in Figure 2, but that the cut-away portion does not cut through a bolt hole so that bolt holes are not illustrated in that view. The reference to bonding in Santella refers to bonding two parts of the valve cover together by contacting a molten thermoplastic portion of a part to molten thermoplastic portion of another part. No adhesive is disclosed for such bonding, see col. 4, line 14-18. An English translation of Japanese Patent 6,218,754 of which an abstract was previously provided is enclosed herewith. This reference shows a head cover secured to an engine head using nuts and bolts, see page 2, lines 10-11 and page 3, lines 20-22. It is further disclosed that the sealing power is provided by bolts, see page 2, lines 21-23 and page 4, line 34. The reference further discloses that an adhesive is used to seal between the valve cover and the engine head, see page 4, lines 8-12, 21-22 and 25-28. Furthermore, Frohwerk et al., U.S. Patent 5,957,100 (hereinafter Frohwerk), discloses the use of bolts to connect a cylinder head cover to cylinder housing. See col. 2, lines 53-57 and col. 3, lines 31-35. Frohwerk also discloses the use of adhesives to enhance sealing of the gasket, see col. 3, lines 20-27.

All of the cited references which disclose how a valve cover is attached to a cylinder head disclose it is necessary to use of bolts to affix and hold the valve cover to a cylinder head. Furthermore, all of the references disclose the use of an adhesive to enhance the seal between a valve cover and a cylinder head. None of the references teach or suggest modification of any of the references to achieve the features cited hereinbefore as novel elements. The references do not teach the use of an adhesive to hold the valve cover in place. The Official Action on page 2 in part 2 states: "Mochizuki et al. disclose an adhesive sealant with tensile strengths up to 40 kilograms force per centimeter" and then concludes it would be obvious to use the adhesive to bond and hold a valve cover in place. The conclusion does not logically follow from the teachings contained in Mochizuki, for the following reasons. First, there is no teaching or suggestion in any reference which suggest the use of an adhesive to hold a valve cover in place under normal operating conditions. All of the references clearly teach or suggest that bolts are used to hold the valve cover in place. Further, Mochizuki provides no teaching of how a valve cover is held in place.

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Mochizuki discloses an adhesive composition which has as its primary function a sealing function to seal between a valve cover and cylinder head. Secondly, tensile properties measure the internal strength of a polymeric material not the adhesive strength of that material. Typically to determine adhesive strength, lap shear and peel tests are used. There is no reference in Mochizuki or any of the other references which suggest a suitable lap shear strength for an adhesive used to bond and hold a valve cover in place. In fact, Mochizuki demonstrates that the adhesives disclosed would not be suitable for holding a valve cover in place under normal operating conditions. The description of Test 1 starting at col. 10, line 40 and going to col. 11, line 6 show testing on a variety of samples of the invention for elongation, tensile strength and peel strength. The best sample, Sample 1, shows a peel strength of 2.5 kilograms force which translates to 34 psi. The lowest tensile strength demonstrates is 0.3 kilograms force which converts to 4 psi. It should be noted at col. 11, lines 2-6, it is indicated that Sample 1 which has the highest peel strength has too much adhesive strength to be used in the claimed invention therein. It is also disclosed that much lower peel strengths are desirable. Thus, the data demonstrates a relatively low adhesive strength, which is enough to improve the seal but certainly not enough to hold a valve cover in place without the use of bolts. Further, this data indicates that there is no correlation between the tensile strength and the peel strength, and thus there would be poor correlation between the tensile and adhesive strength. Furthermore, this reference discloses that low adhesive strength is desirable so that the sealing material can easily removed from the cylinder head or valve cover. See col. 4, lines 5-6 and col. 4, lines 54-63. This passage alone motivates one skilled in the art away from modifying the adhesive and then utilizing the adhesive to bond the valve cover to the cylinder without the need for bolts. The reference does disclose how to make higher strength adhesives, but it provides no motivation to do so.

The Official Action on page 3 in part 2 states: Mochizuki et al. fail to recite the functional language added to Claims 1, 11 and 28, specifically, 'wherein the adhesive has sufficient cohesive strength to hold the valve cover in place during normal operations'. However, Mochizuki disclose the adhesive as a holding strength of 568 psi. One having ordinary skill in the art would have reasonably assumed that

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such a holding strength would encompass the above-functional recitation. Moreover, such adhesive qualities would negate the need for bolts (re Claims 2 and 32) as a securing means to one of ordinary skill in the art." This statement has several errors in logic. First, Mochizuki discloses an adhesive which has a tensile strength of about 568 psi and not a holding strength of 568 psi. See the discussion of the difference between tensile strength, peel strength and lap shear strength. Furthermore, see Table 1, as discussed hereinbefore which demonstrates that there is a significant difference between tensile and adhesive strength. Secondly, the conclusion that one having ordinary skill in the art would have reasonably assumed that such holding strength would encompass the above-functional recitation is a conclusion without having any motivation provided in the references to support the conclusion. Such a conclusion without evidence of motivation is an improper basis upon which to base a case of *prima facie* obviousness. This assumes that one could have imagined to use an adhesive instead of bolts to hold the valve cover in place. The essence of Applicants' argument is that until Applicants' invention, no one had imagined doing this, and therefore it is novel and unobvious. The statement that moreover such adhesive qualities would negate the need for bolts (re Claims 2 and 32) as a securing means to one of ordinary skill in the art is also conclusory. Absent a suggestion in a reference that an adhesive be utilized to perform the function, no case of *prima facie* obviousness is made out. The fact that at the time of the invention, adhesives existed which had appropriate adhesive strength to function in this manner is irrelevant as no one had imagined using an adhesive in such a manner, and it is incumbent for the Official Action to provide some motivation in the art which clearly suggest to one skilled in the art that such an adhesive be used to bond and hold a valve cover on an engine cylinder head.

Furthermore, the standard at the time the invention was made was to use bolts to hold valve covers on cylinder heads. Relative to Claims 27, 29 and 31, which provide a Markush list of preferred adhesives, the Official Action argues that it would be obvious to use such recited compositions to hold a valve cover in place because such adhesives are disclosed as useful as disclosed in Mochizuki. Mochizuki discloses such adhesives are useful in sealing between a valve cover and a cylinder

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head. As Mochizuki does not disclose the use of a structural adhesive to bond and hold the valve cover in place, the teaching of Mochizuki which discloses adhesives which are suitable for sealing is irrelevant to the issue of suitable adhesive families to bond and hold an engine valve cover in place. Similarly, the argument that cure-on-demand techniques and preferred heating techniques are disclosed in Mochizuki, and therefore useful in bonding a valve cover to a engine cylinder head is inappropriate in that Mochizuki does not teach one skilled in the art that adhesives can be used for such function and as such cannot suggest to one skilled in the art which adhesive processes could be used for such. This is relevant to Claims 3 and 19-21. Relative to page 4, paragraph 5 of the Official Action, the following comments are relevant. The Official Action states: "Mochizuki et al. disclose engine heads and engine head cover adhesively bonded using multiple techniques such as catalysts, irradiation and anaerobically curing and heat curing". This statement is an incorrect statement of the teachings of Mochizuki. Mochizuki teaches using an adhesive composition to enhance the seal between an engine head and an engine head cover. Mochizuki does teach that such compositions would bond to the engine cover and to the engine head to enhance sealing properties, but does not teach bonding these parts together an adhesive. Furthermore, as mentioned hereinbefore, Santella and Japanese reference discussed hereinbefore disclose that bolts are used to hold such parts together. On page 5, in part 6, the Official Action states: "Santella teaches the use of connecting the valve cover to the head with or without fasteners". This is a mischaracterization of the teaching of Santella. Santella does not teach a valve cover without bolts or that it can be connected to the head without fasteners. All of the illustrated valve covers in Santella have bolt holes.

Mochizuki refers to adhesion for the purpose of improving the seal not for holding the valve cover in place. Further, Mochizuki recognizes the insufficient releasability of some adhesives, but it does not suggest how such unacceptable adhesives could be used or that they could be used in place of bolts to hold a valve cover in place.

As the official action does not establish a case of *prima facie* Claims 1-7, 18-23 and 26-32 are patentable under 35 USC §103(a). Applicants respectfully

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request reconsideration in view of the arguments presented and solicit early allowance  
of Claims 1-7, 11-14, 18-23 and 26-32.

Respectfully submitted,



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